Earthquake Loss Estimation Model

HAZUS is a nationally applicable standardized methodology and software program for estimating potential losses from earthquakes, floods, and wind. **HAZUS** is being developed by the Federal Emergency Management Agency (FEMA) under contract with the National Institute of Building Sciences (NIBS). **HAZUS** now has the capability to estimate earthquake losses, with flood and wind models are under development. NIBS maintains a committee of earthquake engineering experts to provide technical oversight and guidance for continuing model development.

Earthquake Model

Earthquake loss estimates are forecasts of damage and loss to buildings, infrastructure and population that may result from potential earthquakes. Loss estimates produced by **HAZUS** are based on current scientific and engineering knowledge of the effects of earthquakes. Estimating losses is essential to decision-making at all levels of government, providing a basis for developing mitigation policy, emergency preparedness, and response and recovery planning.

HAZUS uses geographic information system software to calculate, map, and display earthquake hazards and damage and loss estimates at three levels of complexity. Level 1 analysis uses national level data sets that are included with the HAZUS methodology. Level 2 analysis allows the user to modify the national level data with local data for more refined results. Finally, Level 3 analysis allows users to supply their own techniques to study special conditions such as dam breaks and tsunamis. Engineering and other expertise is needed at this level.

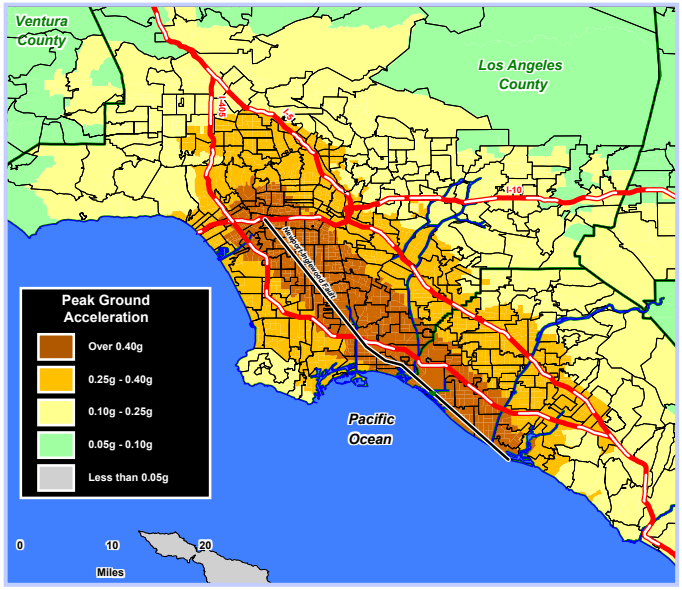
FEMA will release an enhanced version of the **HAZUS** Earthquake Model at the end of 2002 with the new multihazard HAZUS03. An interim service releases (SR2) is now available and includes the new Advanced Engineering Building Module and an improved casualties model.

Multihazard InCAST

The InCAST inventory collection tool is available with **HAZUS** to facilitate building information and other data collection. A new version will be released in 2002 with expanded capabilities for multihazard data collection. InCAST will assist users with collecting and managing local building data for more refined analyses than are possible with the national level data sets that come with **HAZUS**.

Earthquake Loss Estimation

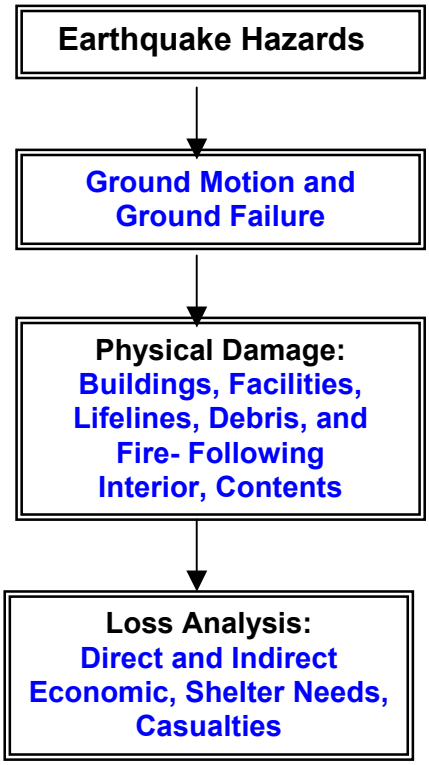
HAZUS was first released in 1997. The 1999 version and SR1 and SR2 have been improved with greater speed, capability, and data. HAZUS creates results in just minutes and allows disaster response personnel to generate loss estimates immediately following earthquakes and to update estimates as data is collected during field reconnaissance.



The **HAZUS** Earthquake Model has the following features:

- A building classification system based on the characteristics of building structure and frame.
- Capability to compute damages to residential, commercial, industrial buildings, essential facilities, and transportation and utility lifelines
- Capability to compute damage to building structure, contents, and interior.
- Capability to estimate debris quantities, shelter needs, fire following, and casualties.
- Ability to estimate direct and indirect economic losses.

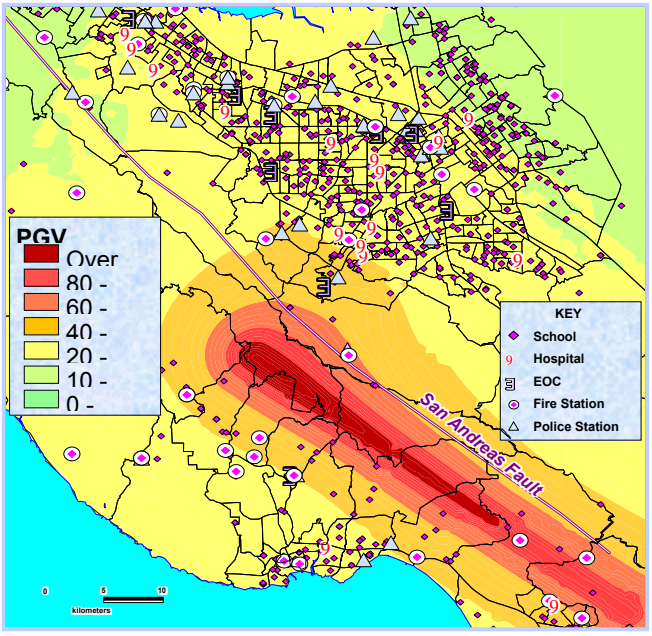
The figure below shows the various elements of the Earthquake Model.



Summary

The Earthquake Model allows users to

- formulate and evaluate policy programs to reduce earthquake loss, including general mitigation strategies;
- estimate required resources for disaster relief;
- improve emergency response planning through scenario analysis;
- plan response and recovery efforts after earthquakes;
- plan for debris removal and technical assistance following disasters;
- estimate displaced households and shelter requirements; and
- provide for multiple levels of analysis with national level data as well as user and expert-supplied data.



Critical Facilities Overlaying Shaking Map from the 1989 Loma Prieta Earthquake

Receive More Information

Visit the **HAZUS** website at **http://www.fema.gov/hazus** or contact:

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